

Annealing treatment

For further reducing the content of metastable OH groups, the jacket tube is subjected to an annealing treatment at a temperature of 1040°C for a period of 200 hours with nitrogen flushing. With a known diffusion coefficient of the metastable OH groups in the quartz glass, it would be possible to arithmetically determine the content thereof in the jacket tube after the annealing treatment. As will be explained in more detail in the following, the annular disk is used in the embodiment for this purpose in that said annular disk is subjected to the same pretreatment as the jacket tube.

Results of the measurements of the OH content

Subsequently, the OH contents are determined by spectroscopy in the jacket tube and in the measurement sample in that measurements are each time carried out over the whole wall thickness of about 50 mm. The measurement place in the jacket tube is here in the center with respect to the two tube ends. The measurement results are indicated in Table 1.

Since in terms of spectroscopy a distinction cannot be made between metastable OH groups and anneal-stable OH groups, the result of the measurement as taken shows the total content of OH groups in the jacket tube and in the annular disk, each averaged over the wall thickness. Due to the increased diffusion length, the jacket tube (with a diffusion path of about 25 mm) has at 0.35 wt ppm a slightly higher total content of OH groups than the annular disk (with a diffusion path of 5 mm).

By comparison, the OH content of the annular disk could be lowered to 0.32 wt ppm. Since the annular disk after the anneal treatment according to the above definition of the metastable OH content (temperature = 1040°C, treatment period > 48 h, diffusion path ≤ 5 mm, inert gas flushing) no longer contains any measurable content of metastable OH groups, the measured OH content of 0.32 wt ppm must be completely present in the form of anneal-stable OH groups. Since anneal-stable OH groups cannot be eliminated by annealing, this means that the jacket tube also has a

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